Collaborative Networked Learning(CNL)
Off-line
An Implementers Guide

Educational Services Research and Development Group

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Collaborative Networked Learning Overview

Collaborative Networked Learning (CNL) is that learning which occurs via electronic dialogue between self-directed co-learners and learners and experts. Learners share a common purpose, depend upon each other and are accountable to each other for their success. CNL occurs in interactive groups in which participants actively communicate and negotiation meaning with one another.

Important changes motivate the focus on CNL in this resource. Three factors underlie the thinking in the resource.

1. **CNL is sound educational practice.**

   Researchers and educators have contrasted collaborative activities with two other categories- competitive and individualistic. Competitive activities, for example, include those in which only one person can win, or where learners compete for grades, rank, or status, rather than when all members focus on achieving mastery or competence. Individualistic activities, for example, include working in isolation with no interaction with others, or when a learner interacts only with a self-paced manual or CBI, rather than when all members share ideas with each other.

   The overwhelming conclusion of research in the goals of learning environments is that collaborative, cooperative goal directed activities lead to higher achievement. Overall higher achievement translates into higher productivity.

2. **CNL is sound business practice.**

Several major successful implementations of CNL directly involving Educational Services, Digital or Digital hardware and software products provide real-life examples of the guidelines in use. These are summarized in the appendix.

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Much work in the information age enterprise involves collaborative, team oriented tasks. Learning workers share information with one another in order to accomplish common tasks in a small group. Professionals share information with each other, and learn something about each others specialization in order to reach consensus on a common problem. Assembly line workers have increased productivity when workers learned from each other how their different individual parts of the task fit together to produce the whole. All of these different learning workers are engaging in activities which involve collaboration.

Life-long learning in the workplace is becoming a necessity rather than an ideal. The need for collaboration is great and will continue. By facilitating collaborative methods of learning, we could help workers acquire individually and collectively the rapidly, changing knowledge required in the high-tech workplace.

3. **Collaboration is a condition of learning in the information workplace.**

   While the worker in the industrial era factory learned how to manipulate objects and memorized actions, the worker in the modern organization learns how to think, learn and apply information to a task.

   - **Workers need to engage in activities that allow them to approach problems from different vantage points, testing out as8umptions,and redefining meanings,i.e.creative thinking in order to develop new viewpoints.**
   - **Workers need to engage in the social,collaborative exchange of ideas in order to pose hypothetical problems, general hypotheses, conduct experiments and reflect on outcomes. Basically, workers are learning in groups to make meaning out of information. Not only do workers need to make meaning out of the information but in order to actually perform their jobs they need to be able to share that meaning with others.**

This guide is to serve as a basic resource for individuals planning, implementing, and participating in Collaborative Networked Learning (CNL) communities as co-learners. The general guidelines provided here draw upon published research and from experience with successful applications of different CNL models.

Chapter 1

Justification of CNL

Collaborative Networked Learning (CNL) is that learning which occurs via electronic dialogue between self-directed co-learners and learners and experts. Learners share a common purpose, depend upon each other and are accountable to each other for their success. CNL occurs in interactive groups in which participants actively communicate and negotiation meaning with one another.

> CNL is a new way for workers to learn through collaboration with other workers locally and around the globe. Remote, widely dispersed workers are learning collaboratively around the world with non-resident experts (teachers) without leaving the work site. One important way of bringing experts together with learners is through on-line electronic learning environments. In some instances these distributed networked learning environments operate as text-based alternatives to in-person classes, in other instances they operate in conjunction with video or audio teleconferences, and in still other formats as continuations of in-person classes. A variety of formats and media combinations are being developed to facilitate the exchange of information and collaborative learning among groups of individuals.

1.1 CNL is sound educational practice.

Researchers and educators have contrasted collaborative activities with two other categories— competitive and individualistic. Competitive activities, for example, include those in which only one person can win, or where learners compete for grades, rank, or status, rather than when all members focus on achieving mastery or competence. Individualistic activities, for example, include working in isolation with no interaction with others, or when a learner interacts only with a self-paced manual or CBI, rather than when all members share ideas with each other.

The results of on-going research in this area, may help us clarify the desired outcomes of any of our learning environments. David and Roger Johnson[1] have conducted research for the past twenty years on the effects and effectiveness of these three goal structures on learners. In 1981 the Johnsons conducted a review[2] of 122 research studies from 1922 to 1980 relating to collaborative, competitive, and individualistic goal structures. The overwhelming conclusion was that collaborative, cooperative goal directed activities lead to higher achievement. Overall higher achievement translates into higher productivity.

In the collaborative learning environment no one loses. Learning becomes a win/win situation for all of the participants. In general, the interaction process in collaborative groups promotes the discovery and development of higher quality strategies for reasoning than does the individual strategies found in competitive and individualistic learning situations. [3] In competitive situations, learners devote energy to winning by succeeding at the expense of others rather than everyone working together for the higher achievement of all the members of the group. On the other hand, in individual situations, learners only achieve at their level of capability, whereas in a collaborative group the synergy allows each one to exceed his native capability. When applied on a broad scale collaborative learning methods could facilitate a higher level of of achievement for all workers in an organization.

[1] Johnson, David and Roger Johnson. 1976. Learning- Together and Alone tCooperation, Competition, and IndividualixationEnglewood Cliff, N.J.;Prentice-Hall

*** Johnaon, David at al. 1981. The affacta of Cooperation, Competitive, and Individualistic Goal Structures on Achievement: A Met*-Analysis." Psychological Bulletin, 89, pp. 47-62.**

*** Alfle Kohn provides a comprehensive discussion of these issues in two recent publications. Kohn, Alfle. 1987. "Its Hard to Get Left Out of a Pair," Psychology Today ,Vol 21.no 10, pp. 52-67. and Kohn, Alfle 1986Jfo Contact/The Case Against Competition. Boston, Houghton Mifflin Co.**

1.2 CNL is sound business practice.

Much work in the information age enterprise involves collaborative, team oriented tasks. Learning workers share information with one another in order to accomplish common tasks in a small group. Professionals share information with each other, and learn something about each others specialization in order to reach consensus on a common problem. Assembly line workers have increased productivity when workers learned from each other how their different individual parts of the task fit together to produce the whole. All of these different learning workers are engaging in activities which involve collaboration.

Organizations, such as Digital, according to George Huber[1] will be qualitatively,radically different from those of previous organizations. One significant factor in today's organization is the amount of available knowledge, the growth rate of knowledge, and the shorter useful life of information. Consequently, life-long learning in the workplace is becoming a necessity rather than an ideal. Increasing amounts of time and energy are being spent to make sure that workers have the up-to-date skills and knowledge required to do their jobs. At the same time workers are being required to spend more time learning to stay on top of their jobs, they are becoming more specialized in their knowledge. With specialization comes the need for collaborative interdependence in order to perform the complex tasks of today's workplace.

The need for collaboration is great and will continue. By facilitating collaborative methods of learning, we could help workers acquire individually and collectively the rapidly, changing knowledge required in the high-tech workplace. We could also foster collaborative methods of information sharing to help groups make meaning out of information as the basis for solving some of our difficult tasks.

[1] HttlMT, CUorg*. 1984. "!%• Natur* and D«rign of Po«t-Indu«trial Organization*, Manafmt«at 8cUoo«,Vol 30, pp. 928-961

1.3 Collaboration is necessary for learning in the information workplace.

While the worker in the industrial era factory learned how to manipulate objects and memorized actions, the worker in the modern organization learns how to think, learn and apply information to a task. In essence, today's worker is learning meaning rather than just rote procedures. Even the worker in today's automated factory must connect meaning to the data appearing on the terminal screen. Drawing on the work of educational psychologist Lev S. Vygotsky, Dr. Gloria Schuck[2] outlined two basic conditions for learning in the high-tech workplace:

1. **Workers need to engage in activities that allow them to approach problems from different vantage points, testing out assump-tions,and redefining meanings,i.e.creative thinking in order to develop new viewpoints.**
2. **Workers need to engage in the social,collaborative exchange of ideas in order to pose hypothetical problems, general hypotheses, conduct experiments and reflect on outcomes.**

Basically, workers make meaning out of information when they are encouraged to engage in creative mental activities and have an opportunity to test out their hypothesis with other individuals.[3] Not only do workers need to make meaning out of the information but in order to actually perform their jobs they need to be able to share that meaning with others.

' Schuck, Gloria. 1966. "Intelligent Technology, Intelligent Workers: A new Pedagogy for The High-IWh Work Piece," Organisational Dynamic* Vol 14, pp. 66-79.

*** Eventually we will move into an era when intelligent expert systems will become a part of the on-line collaboration. At the prevent time, expert ayatem* are not partner* in the collaboration but aopport tools. Collaboration would require interactire negotiation of meaning and responsiveness, i.e. a dialog. Research ia still formative in this area but in general would require sophisticated interfaces such ss natural language interface* and responsiveness to the messages of the learner rather than passive viewing of machine messages.**

1.4 CNL Learning Models Check list

The following items might serve as a check list to help the users determine the appropriateness of CNL learning models for their needs. The more closely the characteristics match those in the check list, the more likely CNL an appropriate approach for the situation. The CNL learning model* involves aspects of the following:

- **Topics are unstable or being created**
- **A problem or question has no clear answer yet**
- **Learners are more often self-directed than other directed**
- **No one person has the answer—it is dispersed or hidden within a group or organization**
- **The answers are obtained by groups of workers in cooperation who may be widely distributed**
- **An unstructured or networked approach is usually taken**
- **Knowledge needs to be captured, synthesized.generated, filtered and summarized**
- **Involves asynchronous or synchronous interaction among learners who may not be co-located.**

checklist pr*par«d by L*«li« Wittman and Mark Gill, from DIS/HRM

Chapter 2

Planning

2.1 Determining Purpose

Tb make Collaborative Networked Learning (CNL) experiences focused and efficient, clearly define and announce the purpose. Several basic purposes are described below.

2.1.1 Purpose defined by organizer

The organizer/ facilitator of CNL might defined the purpose in advance of securing participation. In this *type* of CNL, participants would join the group based upon a desire to share in accomplishing the pre-defined purpose. The purpose could be very specific such as: " The members of this group will prepare a marketing strategy for value added services for DSN;" or more general, such as: The members of this group will learn about and share information regarding value added services for DSN."

2.1.2 Purpose defined by the group

The purpose might initially be more loosely defined, based upon the prior knowledge of the selected group of participants such as, "the members of this group will pool their knowledge to develop a long-range adoption plan for CNL." Or, "the purpose of this CNL forum is for experts and novices to share their experiences moderating a

learning forum." As the group learns more they will continue to refine their purpose.
Learning in the context of problem-solving is a example of a more general group purpose, where the specific learning and outcomes are refined based upon the goal and prior knowledge of the invited participants.

2.1.3 Purpose defined by on-going needs

The learning purpose in these situations is open-ended and on-going. The group with a broadly defined learning goal will determine specific operational purposes based upon current needs. Frequently, existing learning groups define their purpose based upon a long-term mission. On-going learning within a particular domain and group is motivated by the rapid rates of change being experienced in our society and the work group. The group which starts with an open purpose may from time to time want to refine their purpose,based upon new information and current mission, for two reason:(l) to know what they have accomplished and that the experience was worth the effort (2) to establish criteria for completeness, or "doneness."

When one speaks of purpose-driven CNL, it does not necessarily imply either a closely defined initial purpose or an open purpose. It implies that as part of the experience the group develops a shared purpose and that their interaction is focused on accomplishing that purpose. The purpose-driven interaction criteria distinguishes CNL group activities from Bulletin Board Systems (BBS) in which individuals post and access the latest available information in an area.

While the group has a stated work related purpose such as those mentioned earlier, it is also likely to fulfill a social functional for the members. It is important that both the stated purpose and the personal purposes of the members be considered as the group interaction continues.

2.2 Determining goal structure

In a CNL group the members share a cooperative goal structure. Cooperative structures contract with two other structures—competitive and individualistic.

- **A cooperative goal structure is the desired norm for CNL.**

  According to Johnson and Johnson [2] members see a positive correlation among group members' goal attainments- that is, they perceive that they can achieve their goal if and only if the other members with whom they are linked obtain their goal.

  For example, when a group lifts a heavy object or members of a software development team integrate and debug a new application, all members experience the success.

- **Competitive goal are not as effective for CNL.**

  In a competitive situation, there is a negative correlation; members perceive that they can obtain their goals only if other members fail to obtain their goal.

- **The individualistic goal structure is inappropriate for CNL.**

  In contrast to these two group goal structures is the individualistic goal structure common in many learning environments. The individual is rewarded for his/her own achievement and the achievement is generally unrelated to that of others.

CNL groups are based on a shared cooperative goal structure. As work occurs more and more in teams requiring the combined expertise of different members, the cooperative goal structure of CNL is more likely to support the overall goals of work group process than highly competitive or individualistic approaches.

[1] Johnson, D.W. & Johnson, R T. 1987. f .Miming Tog»Ui«r and akm*tCoop«ratiT«, co*»p«titiT«, and in4ivida*li»tic fearniagttnd si) EngUwood Cliffs, NJ: Pr*ntic*-Hall.

2.3 Creating an Intentional Learning Group

Participants in CNL establish an intentional learning group [1] electronically with a cooperative goal structure. The intention of the members is to engage in the learning process together. The members commit to the group and the achievement of a mutually defined purpose.

There are two primary categories of intentional learning groups:

1. **Existing groups, teams and work groups decide that they need to learn and can accomplish their learning goals together,and**
2. **Individuals organize groups and invite others to participate based on a defined and shared learning goal.**

2.4 Selecting a CNL format

Three basic CNL formats have been successfully implemented.

1. **All Electronic in which participants accomplish their learning all on-line. The electronic form could be text-based, audio or video collaboration or any mix of media. The Irish Aquaculture Conference is a example of the all electronic structure. Regular audio and video conferences for sharing ideas,debriefing and developing strategies are also common examples of this form of collaboration.**
2. **Before or After an in-person class or group meeting, such as the electronic pre-course for the Digital Management Educational Seminar," Managing Small Projects. Before a face-to-face meeting, electronic interactions provide an opportunity for all participants to review and share basic background content prior to real-time interaction. After an in- person meeting, the group can continue the interaction and address new issues as they occur.**

[1] **I UM the term "intentional" to auggeet that the participant* "belong" to a group to achiere a purpoae and that it ia their "Voluntary" intention to accompliah that purpoae. CNL are different from natural group* or eommunitiea eince they often eziat only through the electronic world.**

3. **Mixed mode in which participant* attend class or listen to broadcast video in conjunction with interacting on-line. The Communications Skills seminar provided learners an opportunity to interact with each other between face-to-face meeting!. The Field Service Electronic Seminar and WGBH On-line integrate video broadcasts,text based materials, and computer conferencing.**

2.5 Selecting Media Formats 2.5.1

Synchronous and asynchronous

Synchronous communication **involves a real-time connection through media channels for two way video, two way audio, or text-based computer conferencing. These "distributed" environments can be a cost effective method for helping workers share information and collaborate regularly, without the time and expense of travel.** ***Asynchronous communication*** **does not require that participant* be available in real time. It is basically a store-and-forward communication strategy; individuals unable to schedule a "get together" can still collaborate, using asynchronous media such as E-mail and computer conferencing.**

It is important to match the purpose and overall goals of the group with the appropriate media. The table below summarizes key distinquishing characteristics.

Table 2-1: CNL Technologies

Synchronous		Asynchronous)
In Tim*	In Space	Neither Time nor Space
Audio conferencing		Voice-mail
Photo-phone		E-mail
Freeze*frame video over public telephone		Text based "notes" conferencing
PC with keyboard and freehand graphics with audio conferencing (OP-TEL)		Fax
Video networks with two-way •udio	Group Support SW in LAN (Colab)	Graphic messaging systems

Table 2-1 (Com.): CNL Technologies

Synchronous		Asynchronous
		Neither *Timm* nor
In Tint*	**In 8pac«**	**8p«c«**
Video teleconferencing		

In many on-going situations it will be economically possible and feasible to mix media of interaction to the overall purpose,budget, and current stage of interaction.

2.5.2 Computer-mediated communication (CMC)

The use of computer networks to facilitate the learning process is part of a larger effort which focuses on the use of the computer as a human communications medium. Interaction at the present time utilizes text and graphics to facilitate both simultaneous and asynchronous collaboration. Future projections call for all media types to be integrated at a networked workstation, within the next five years.

2.5.2.1 Remote,dlstrtbuted networks

Text-based computer conferencing software has been in use since early 1970 on time sharing computers. They are now available through extended, distributed networks with software such as Digital's VAXnotes. Elaine Kerr and Roxanne Hiltx, explain:"...computer communication is a new medium for building and maintaining human relationships. It is faster and cheaper than alternative methods for linking geographically dispersed people in working groups,but more importantly, it tends to expand greatly the human and information resources to which one has constant and convenient access.[1]

[1] **Kerr, Elaine and Starr Roxanne Hiltz. 1984. Computer-Mediated Communication Syatemat Statoa and Eraln*tioa.N«w York, Harcourt Brae* and Joranorich.**

Digital's primary products in this area for private communication is El-mail, and for group communication is VAXNotes. Third party computer conferencing software is readily available for group communication on VMS; the most notable is Caucus marketed worldwide by MetaSystems.

Workers who need to engage in on-going learning want to find the most efficient means to achieve their goals. In a CMC network, learners determine their own time, place, and pace of learning activities. The primary distinction, and advantage, is that interaction does not have to be conducted in real time or space. In essence, the electronic network becomes a 'place' in the minds of the users.

2.5.2.2 Local computer networks

The use of computer networking is not restricted to distant communication, but can also enhance the information access, structuring, and sharing by co-located,face-to-face groups. Each individual is connected as part of a local area network within the room. The network would also provide immediate access to information not physically present in the room. Groupware (software for group enhancement) aids the participants in the structuring and sharing of common information.

Software tools that support the learning process are being developed to assist the work of small groups of individuals. Users of these tools are usually all together in the same physical space such as a classroom or conference center, but they could be spread out in a factory work unit, as well.

2.5.3 Audio Conferencing

Voice-only networking is the simplest,least expensive and perhaps the most widely used form of electronic networking. The benefits of audio networks include cost-saving in travel, particularly where periodic, limited duration collaboration is required. In many cases, individuals only need to share limited pieces of information in order to reach understanding. However, the bits of information may be owned by a number of widely distributed individuals. Or, the individuals who need the information may be widely separated from the one or two experts in

the field. When two-way communication of information among a group is necessary for gaining understanding, the ease at which an audio only network can be set-up makes it an ideal, cost effective media for sharing information,immediately as soon as the need arises.

Audio conferencing service is avail internally through the DIBS (Digital Integrating Briding Service) for DTN users. For interaction among customers worldwide AT&T offers regional and international bridging service.

Until recently each individual participant had to be available to interact at the same time as all other participants. Recent developments with voice-mail systems.which operate much like telephone answering machines,are beginning to remove this restriction for participants.

However, for voice-mail systems to be a useful technology for us, we will need to develop ways of storing,aocessing, and forwarding large quantities of digital audio files.

2.5.3.1 Audiographic

Audiographic networking technology involves adding a graphic or visual component to audio channels. Two technologies have potential uses for us in supplying cost-effective audiographic collaboration: freexe-frame video and computer controlled graphics. Audiographics offer the advantages of two-way audio interaction discussed above, plus the added advantage of visual,graphic information which can be used to support the audio interaction. Depending upon the content of the information, the visual component may be critical. For example, when complex diagrams, designs, or pictorial information is necessary for interaction, audiographic systems are an effectiveness expensive collaborative medium than full motion video.

2.5.3.2 Fr»«ze-fram« video

Freeze-frame video is less costly than full motion video for remote collaboration among a number of locations. Freeze-frame video is useful for transmitting not only two-dimensional illustrations to support information sharing, but it can also transmit pictures of equipment and prototypes. This media offers the possibility for transmitting 3-D images at low cost for group collaboration. It also has the added

advantage of transmitting images of the participants which help to create a feeling of contact which audio alone does not offer.

Freeze-frame video systems can do anything for users that full-motion video can do, except of course transmit motion. Systems use public telephone networks to link geographically dispersed locations.

Essentially, freeze-frame conferencing equipment freezes a frame of video information, from any analog source such as a camera or videodisc, codes it into digital data, stores it in memory and transmits it over remove dial-up lines at 4,800 BPS . At the other end, the digital data is transformed back to analog and displayed on a screen. Initially, each site would need to be equipped with cameras, monitors, printers, and audio systems. The price of operation,however, is only the price of two long distance phone calls for the duration of the session.

A comparatively less expensive system, Photophone,has been tested within Digital by the Telecommunications Group. At the present time Photophone, marketed by Vidlel, is the Digital preferred internal vendor. It operates over a single line between locations and thus blanks while video freeze-frames are being transmitted.

Groups in central engineering who need to collaborate on product design are using their systems on an on-going basis to cut down on travel time and cost. While it is useful for two location sharing of graphics and visual images, the basic model affords little opportunity for multi-location group collaboration.

At the present time, Digital is currently developing a board level product for transmission over the E-net for use with workstations. Commercial release of the product is expected in early FY 91. It will theoretically be possible to create small distributed groups using E-net channels.

2.5.3.3 Computer Audlographict

Audio conferencing with computer graphics and computer interaction can link a number of locations together for sharing graphical information as well as carrying on audio interaction among the participant*. By adding the capability of audio to a text and graphic network, the lose of fidelity of interaction can be reduced. Computer audiographics

has been successfully used to aid collaborative learning in a number of corporate environments.
IBM currently uses a system which in many respects is similar to freeze-frame video, except it is integrated with an IBM PC-XT. Graphics and text pages are prepared in advance of a session, called up and transmitted with a 3-5 second delay during the interaction. The IBM system is reported to support interaction over normal telephone networks to link multiple geographically dispersed locations.

AT&T currently conducts multi-location audio conferencing in conjunction with personal communication graphics and text files for employee sales training. AT&T through a cooperative marketing agreement with OP-TEL in New York began selling the equipment and service in late 1988. The same system was also used with favorable results at Harvard last fall for a semester intensive calculus class.

The supporting software developed by OP-TEL of New York links the OP-TEL Telewriter II PC audiographic units or MS-DOS compatiable computer with AT&T's Alliance Teleconferencing Service.[1] The service can provide computer based synchronous audio based networking for up to 59 locations.

Basically, computer audiographic systems operate like an electronic blackboard which allows all users to create keyboard and hand drawn graphics. These graphics can be stored, transmitted, and annotated by any of the learners on-line. The drawing space is not shared but transmitted by each user. The voice channel and the data channel share the same circuit simultaneously. The use of such system has been primarily for one-way presentation with questions. The technology could easily be used for more collaborative learning and sharing of information.

Interactive audiographic systems such as these can provide learning opportunities at the desktop computers of widely dispersed learners. Travel time is eliminated and the cost of information sharing is reduced.

[1] **The •yatem currently operatee on IBM and MS-DOS compatible equipment; however OP-TEL haa •xpreawd intereet in developing aoftware for uae with low-end Digital equipment.**

2.5.4 Video Conferencing

There are currently two basic versions of video networking. (1) Point-to-multipoint broadcast by closed circuit television provides two-way audio interaction with any number of remote sites. Digital Video Network is an example of this type of network. Programs are broadcast through a satellite uplink to an increasing number of Digital sites which have receiving downlinks. The network can easily be expanded to include temporary broadcasts to commercial hotel sites, or become part of a global network for international exchange. (2) Two-way interactive video conferencing using T-l digital telephone lines. At present high fidelity interaction can be achieved through portable video conferencing which transforms ordinary conference rooms into video conferencing facilities. The units which currently sell for about $34K (and decreasing with market competition), can be rolled into an existing conference room. The self-contained systems support two-way interactive video, audio, graphics, and data communications. Video conferencing which once required participants to travel to a permanently equipped conference center,or a local hotel can occur between small groups at different locations through spontaneously dialed connections from a keypad console.

The current technology using T-l switched digital telephone network mirrors routine telephone service. By simply dialing, the user can connect between two of the companies locations or to customer sites. Regular telephone charges apply to these connections.

The Telecommunication's Business Consulting Group at VRO can assist users in planning and using this equipment.

2.6 Planning Considerations Check list

Since CMC at present is text-based communication, it requires only a narrow bandwidth for transmission and consequently is a low cost means of asynchronous collaboration. The present text-based nature of the interaction also reduces the fidelity, and social presence of the interaction. All of the non-verbal cues of face-to-face communication are missing. In general, as bandwidth narrows, the medium is perceived as being less personal and affording less social presence. These characteristics limit the acceptability, particularly by first time, inexperienced computer users.

CMC alone can definitely be an effective means of collaboration for experienced computer users. It can also likely be efficiently employed with inexperienced users as low-cost follow-up with any of the more expensive options discuss here. For example, expensive high bandwidth, interactive video could be used to establish initial contact and social presence. CMC could then be used as a less expensive, narrow bandwidth follow-up strategy.

For groups that will be interacting over a long period of time, a face-to-face meeting could be held prior to extended CMC activities. In other instances, text-based conferencing could be used in combination with video and audio networking to increase the feelings of connection among the participants over time.

The conferencing system needs to be tailored to the particular needs of the group. Group are able to adjust conferencing systems to suit their own needs, provided the initial system is sound and flexibility is accommodated. If a group is not able to work in a suitable environment, the conference will fail.

During planning ask the question: "Who needs to communicate with whom about what", at what time and in what medium. The practical questions include the following.

- **Can participants message each other?**
  - **Can the moderator message participants individually?**
- **Will the 'conference* be one conference, or a principal conference and sub-conferences for special purposes?**
- **Will the conference be serial (the only ordering of comments is by time-of-writing), or will there be a topic/reply structure (in which comments are grouped both by time and by relevance to a 'seed' comment (like VAX Notes)? If there is a topic/reply structure, will**

it evolve during the conference, and how many and what topica will be established at the start?

In a directed (or purpose-driven, or meeting-like) conference, will there be deadlines within the conference for particular issues to be resolved, or will all issues stay debatable until the end? How might any deadlines interact with participants' ability to join the conference over a period? Will a "voting" structure be used to establish that a group consensus has been reached on individual issues?

Will their be a mixture of different media text, audio,and video for different purposes at different times during the groups existence?

Will the conferencing be synchronous,regularly scheduled "meetings," or will it be an asynchronous messaging system?

Will there be sub-groups in which a sub-set of the participants address a particular task/topic/issue?

Chapter 3

Launching the collaboration

Engineering the group culture in which collaborative learning can occur is one major part of the successful implementation.

3.1 Maximizing Participant Involvement*

Most successful CNL applications are characterized by high levels of participant involvement and spontaneity. In Dr. Mary Douglas's "theory of organizations", organizations fall into one of four categories, depending upon the degree of structure (organizational differentiation and bureaucracy) and solidarity (the degree of social bonding).

```
High structure   High structure Low
solidarity   High solidarity

A--Hierarchical,   B--Armed services
intra-coapetitive
organizations,e.g.
traditional
teacher lead
classroom



Low structure    Low structure Low
solidarity   High solidarity

a—Individuals    D—research team
 (low group       and study groups
  culture)         (high group culture)
```

At the start of CNL, participants will typically be in cell C above. The goal is to move them into cell D.

adapted by John Gundry from seminar material dereloped with Western Behavior Science Institute

The practical actions to achieve this goal can be considered in three areas:

- **Planning appropriate conference system (See Chapter 2)**
- **Context creation**
- **The actions of the moderator or organizer**

3.1.1 Context creation

CNL creates an electronic social environment which did not exist prior to the collaboration. Conference organizers begin a conference by setting the tone and context for the interaction through one or more of the following strategies:

- **Kick off meeting, either face-to-face or video conference, to allow participants to get acquainted personally and develop group cohesion,**
- **Distribution of decisions on the goals of the conference,**
- **Distribution of conference reading materials,**
- **Opening comments made by the moderator set the tone and ground rules for the subsequent interaction.**

It is also important to pay careful attention to the on-going communication among the participants to help create a supportive context for the interaction. The overall context needs to support positive collaboration.

3.1.2 Practical actions for the moderator or organizer

- **Announce the theme of the discussion so that participants can identify with it.**
- **Decide on a familiar communication metaphor for the conference: is it like a meeting, like a presentation-based conference, like a symposium, like a seminar, like a lecture, like a classroom, like a group encyclopedia, like a workshop, like an interview, like a newspaper, like CB radio or a chat-line ….. or what?**
- **Define the agenda of the conference: selecting an order and flow of topics, and setting expectations about the end-state of the conference and what participants will gain from it.**

- **Set expectations about the role, actions and workload of the moderator and of the participants.**
- **Define the conference etiquette - defining acceptable and unacceptable on-line behavior.**

3.2 Develop rules and guidelines for participants

In order to minimize personal and legal conflicts it is important to develop general ground-rules and guidelines for participants. It is particularly important from a legal stand point when customers are involved to have these guidelines in place to protect the information carrier.

In the following section sample rules have been developed by incorporating the suggestions of experienced moderators in the Moderators and Etiquette on-line conferences at Digital.

3.2.1 Absolute Rules and Legal Regulations

First of all, there are the absolute rules of the conference. These spell out the limits of what you may do through the computer medium. Each rule is dictated by the realities of the law.

1. **Do not speak badly of anyone.**
2. **Do not discuss the specifics of crimes.**
3. **Do not talk about pending or potential legal action.**
4. **Do not use obscene or offensive language.**
5. **Do not recruit or sell.**
6. **Do not transgress copyright laws and proprietary rights**

3.2.2 Guidelines

The guidelines are intended to help define and illustrate the absolute rules. Please remember that CNL is a very new phenomenon and we are all learning how it can and can not be used. Most of what appears here is common sense. Many of you reading this will think, at times, "Who could ever do that?". But experience over the last few years shows that people do these things, and with the best will in the world sometimes don't realize that they are transgressing common sense.

1. **Communication norms**

   When discussing different approaches to a problem or issue, please be careful to confine your discussion to the issues and not the person. Although you may disagree vehemently with another person's viewpoint, courteous responses are expected.

   Suppose that someone makes an argument which you feel is wrong. You could respond in any one of the following manners:

   - **Unacceptable: "You'd have to be out of your mind to believe that!"**
   - **Unacceptable: That argument is stupid."**
   - **Acceptable: "I don't believe that."**
   - **Acceptable: "I disagree with that argument."**

   There is no reason to criticize the person or to ridicule the argument. Merely stating that you disagree and explaining why, is sufficient. It is, of course, more politic to say that you disagree, but it is acceptable to say that an argument or statement is wrong, provided you explain your reasoning.

2. **Criminal behavior & legal actions**

   It can be quite hard to determine what constitutes a crime. The best guideline is to avoid any discussion of criminal behavior and legal actions.

3. **Inappropriate language**

   Avoid "cuss-words", "four-letter words" and the like. Additionally, ordinary words can become offensive when used improperly.

4. **Recruiting and selling**

The ban on recruiting protects participants from receiving unwanted solicitations for employment. The ban on selling applies as a general rule when a participant is writing about something in which they have a vested commercial interest and the purpose of writing about it is commercial even if in addition to the purposes of exchanging information. If,solely for the purpose of exchanging information, a participant does describe a product or service in which they have a vested interest, they must declare that interest.

6. **Copyright laws and proprietary rights.**

   If participants are in doubt as to whether the material they are writing is already copyrighted, they should not write it. This restriction applies, however, to verbatim copying. Summaries and revisions of material are allowed. Common sense is used to judge whether the material is essentially a copy or a summary or revision. The situation as regards proprietary material will be determined by the participant individually.

6. **Encouraging Responsible Behavior**

   Anyone writing in a text conference or part of an audio or video conference should introduce themselves. This accomplishes two things. It helps us to know each other and to take responsibility for our behavior, and it helps the moderator know that you are familiar with the rules and procedures.

7. **Dealing with infractions and complaints**

   No matter how well-intentioned one is, being human, one can expect to write comments here which unintentionally offend others or break one of the conference rules. When this happens, one needs to handle it expeditiously and with sensitivity. The following procedures are intended to enable us to deal with the problems as quickly and with as little fuss as possible. PLEASE follow them if there are problems.

   If any person finds a conference comment objectionable, they have the right to contact the chairman and request that action be taken.

   In a text based conference this may involve

   - **deleting the comment and re-posting it in an edited form,**
   - **deleting it all together,**
   - **posting a clarifying or explanatory comment,**
   - **a simple explanation to the objecting party,**

- **withdrawal and replacement of the comment. In an**

audio or video conferencing, this may involve:

- **stopping the conference and discussing the issues if it can be resolved quickly**
- **scheduling a private interaction between the parties and the conference moderator to resolve the conflict outside of the on-going forum.**

3.3 Check List for Communicating with Participants

Previous implementators of CNL have developed the following guidelines to help participants get involved early and stay active.

1. Notify participants about any CNL sessions via E-mail and send the instructions and schedule early.

2. Attend to access security.
   - For text-based Computer Mediated Conferencing.using VAXNotes establish an open,unannounced conference.

     An open conference will eliminate the problems participants have trying to gain access to a restricted conference.

     Restricting a conference adds a level of complexity and increases the potential for access problems. Participants may have difficulty entering a conferences when the moderator has misspelled a name or node,or if the user accesses the conference from a different system. Unless there is critical security issue, it is simplest to run an open conference, but announce it only to group participants. (The facilitator needs the E-mail address for each student to send an announcement of the conference.)
   - For audio and video CNL, use different access numbers for each conference. The telephone company will supply different numbers for each conference so that only the participants for the particular session can connect. Create an electronic distribution list and notify the participants of the number through E-mail.

3. Provide simple directions including how to handle common errors and operating procedures.

   If possible, provide a hands on demonstration of any unfamiliar equipment for the novice user. If this is not feasible provide a clear set of directions, and provide phone or on-line support with a designated individual during the initial start up period.
   - For text-based conferencing, provide a minimal set of instructions for accessing the conference:reading, writing, uploading

and downloading or printing content. Also provide solutions for common error conditions.

One difficulty which needs to be addressed in the directions is the "node unknown" message. If the learner tries to add the conference and the reply is node unknown they should first make sure that they have entered the node name correctly. We would also recommend installing the conference on a node that is short and easy to remember, if possible. We would also recommend using a node which has been in use for a while rather than a new node. Since each network node has a database of nodes which it recognizes.the node for the conference system must be in the database. If the node is not in the database for the system, the "node unknown" message will appear. At this point, the new instructions should direct the learner to contact the system manager to made sure that node 26.37, for example, is added to the system database. It is a simple and not uncommon command for the system manager to add the new node to the database.

For audio and video teleconferencing, make sure that each user and each site has a set of procedures for dialing and making access connection. The user instructions for video conferencing should provide information on where the participants should be positioned in relation to the position of the camera (with portable equipment.) Also provide directions for re-establishing connections and installing any peripheral equipment such as speakers or additional monitors.

For computer network access, provide instructions for the operating interface of the user—both DCL and All-in-One are common within the VMS environment.

Several simple interface approaches have been developed for VAXNote*.

- **For terminal users,provide directions based upon DCL level familiarity and access for the novice user. Or provide access through the Pass Key interface to VAXNotes.**
- **For workstation users, provide directions for the DECWindows interface.**

- For users of All-in-One interface provide directions which tell then to go to "Additional Applications" on the menu where they could type "Notes" and enter VAX Notes.

With revised directions, and/or a group of computer users more familiar with different applications (for example technical managers), the login difficulties will be minimal.

The moderator or facilitator needs to encourage participants to review and react to contributions of others. CNL provides a new method for learners to share their opinions with each other, to understand that they have different,equally valid viewpoints on issues, and to react to each other in a shared forum. Participants new to the medium need to be encouraged to listen and review the contributions and react to the comments of other group members.

5. Develop guidelines for integration of all phases of interaction with the different media.

   Learners do not want to spend much time in a class or teleconference discussing topics which they had already dealt with in a text-based on-line conference. They are ready to move on to new topics and exercises. There will need to be close coordination between development and delivery so that are topics and supporting information are closely coordinated in the total design of the learning experience.

6. Establish deadlines for completion of structured activities.

   For activities which require coordinated group activities, it is important to create timelines for participation for each phase of the activity so that everyone knows when each part needs to be finished.

Chapter 4

Participating in collaborative learning

In the past when knowledge was resident only in the expert and did not change rapidly, we hired teachers based on their knowledge of the content and their platform skills$_t$i.e. their ability to transmit information to the student. While these criteria are still valuable for success of the individual instructor who is lecturing in front of a live class, they decrease in importance when we move into the electronic on-line environment. In the CNL environment,learning through active participation is a responsibility shared by facilitator and group members alike.

4.1 Role of the facilitator

In CNL the role of the leader" shifts from "giver" or transmitter of knowledge to one of facilitator/coordinator Facilitation [1] involves strategies for encouraging groups of individuals to learn with and from one another to create new levels of understanding and knowledge. In essence the role changes to one of drawing-cut and drawing-together to form a community rather than transmitting a pre-defined, structured body of thoughts or knowledge.

[1] I am not focusing on an individual per se but on • set of behaviors that could be provided by one member of a collaborative team or could be shared by a number of member* over time. The *term facilitator* aa uaed in thi» diacuaaion doea not imply one specific individual.

The CNL facilitator carefully considers and adapts to the differences between the familiar face-to-face environment and the networked environment. The facilitator may be limited in the ability to "read" all of the clues in the environment. For example,the lack of visual or verbal clues increases the demands on the facilitator in the on-line computer mediated collaboration. Furthermore, in audio supported networks,the ability to identify participants and their emotional state from voice tone alone is critical to successful facilitation. In video supported networks, the facilitator's knowledge of the environment is determined by the camera angle and what the participants convey within that framework. While the many uniquenesses are important and deserve additional research, it is important to focus on essential characteristics of facilitation as a basic starting point.

The general guidelines here offer a check list of major areas to address. The materials in the appendix discuss the role of facilitation in more detail.

4.2 System set-up

One of the major responsibilities of the organizer or coordinator of CNL is the logistics of implementing. For groups using a single media it will be necessary to be familiar with the resources for that particular media. For organizers using a combination of media it will be necessary to contact the groups supplying those media within the corporation. The discussion of implementation in this guide will assist the user in the basis of CNL. For users needing specific information about the technology and its application, a number of resources exist.

- **A detailed user's guide and on-line conferences is available for users of the VAXNotes computer conferencing software.**
  - Guide to VAX Notes (AI-G98HA-TE)
  - WARLRD::VAXNOTESJNTRO (help in the U.S.A)
  - **RITZ::NOTES_HELP (help in Europe)**
  - **HUMAN::ETIQUETTE**
  - ATSE::MODERATORS

For CNL using audio conference and video conference technology, special workshops and consulting services are available to plan for the purchase, lease and reservation of equipment. Assistance is available from the Telecommunication Business Application Group within Digital, or from commercial telecommunications and video conferencing vendors regionally and internationally. Furthermore, the discussion of the different media technology in the previous section will help the coordinator make informed decisions.

4.3 Moderating On-line:A Social Infrastructure compendium[1]

The following material provides a list of specific roles and responsibilities for the facilitator of a networked conference. In general, a strong but subtle egalitarian leadership style is appropriate for CMC. One of the first tasks of the leader is to make sure that all participants acquire the ability to communicate in the medium. In general, it is probably easier for participants to acquire the technical skills than the social skills to work in the new media. Even though the group will be working on-line, a number of experts suggest an initial face-to-face (or audio or video if distant prohibits) meeting at the outset in order to: (Dfoster group cohesiveness; constructing friendships, interest groups and alliances,(2)define and outline the purpose and discuss responsibilities (3) and reach consensus on goals, directions, procedures and methods.

4.3.1 Structuring the interaction

The moderator must clarify the group's structure, making clear the differences between private and group messages, conference comments, and notebooks (spaces for group composition in which pages can be manipulated, co-authoring is possible). The organizer will also want to arrange for the use and time of other conferencing media such as audio and video teleconferencing. "Structuring tasks" include:

- **establish expectations about frequency of participation**
- **add and deleting participants**
- **consider separate conferences for separate purposes**

[1] **Adapted from ELAINE B. KERR "MODERATING ONLINE CONFERENCES"Computer Conferencing and Communication* Centre, Reeearch Report 20, February 1984, and Andy Feinberg^fODERATING A COMPUTER CONFERENCES Practical Guide La Jolla, CA:Weei*m Behavioral Science* Institute, 1988, by John Gundry, Enterpriae Deeign Group, Reading, UK**

spell out norms on copying, copyright and confidentiality

clarify responsibility and roles

reach consensus on expectations of task, division of labor, timetable, deadlines

in text based collaboration delete dated or irrelevant comments to reduce information overload

in audio or video conferencing provide update and context from previous interaction

clarify external constraints including relationships with other groups and funding

begin with a minimal structure and allow the group product to evolve over time

4.3.2 Maintain lively, focused discussion

The following suggested behaviors will help the group achieve success. Not all behaviors need to be performed by the same person, leadership responsibilities can be shared.

- **Sharpen, modify, refine and merge the discussion. Locate common threads.**
- **Frequently summarize the group's progress towards deadlines and tasks not yet accomplished.**
- **Ask individuals for a summary of their status.**
- **Stimulate and balance the discussion, keep it on track.**
- **Give explicit feedback to individuals and to ideas, with questions, suggestions, directions, references and implications.**
- **Cross-fertilize ideas; point out areas of agreement and disagreement.**
- **Refrain from posing as final authority - let the group decide.**
- **If there is a final summary as an output,develop a format for the group to use.**

4.3.3 Attend to process details

The following behaviors will help the group get off to a good start and continue to function productively. Leaders will need to attend to the following:

- WELCOME— Friendly and informal first message, reminding people how they can get help. Welcome and introduce members as they join.
- INITIAL ITEMS— Offer people the opportunity to practice with informal short introductions, including their hopes for the conference.
- DIRECTORY— Let people complete their "introduction" entries on line for text based networking or provide background biographic statements for audio or video conferencing.
- SOCIAL GET-TOGETHER— Consider hosting an electronic party (10 - 15 people) or fun get acquainted activity initially. The cost will be justified in terms of group cohesiveness later on.
- MAIL AND TELEPHONE— Mail copies of transcripts to late arrivals, and possibly to all members, to bring them to a common point. Personally telephone those who have special problems with the software or topic being discussed.
- DELEGATION— Assign and recruit volunteers for special assignments, and get buy-in. Some people might be Issue Managers, "chairing" discussions around one issue.
- STROKING— Give positive feedback and reinforcement to both individuals and to conference comments. Help to engender self-esteem. Demonstrate that contributions are valued.
- TIMING— Make sure that new items are waiting when people sign on to text based conferencing. Between audio and video group conferences, follow-up on discussion with with communications to regular participants
- META COMMUNICATION— Encourage the discussion of meta-issues to do with the conferencing itself. Encourage the "coffee break" type of comment. Meta-communication helps the group function more smoothly as a cohesive unit.
- CONTROL—Manage a positive climate, awareness of the current task, the direction of the conference, and its progress to resolution.
- Encourage members to talk to each other, not to you alone or to some vague audience.

Help the group maintain sight of its objectives by refbcusing discussion when the dialog seems to be getting off track.

Encourage all members to participate so that the group is not dominated by a few more verbal members.

NORMS— Monitor the emergence of group norms, particularly those concerning the privacy and confidentiality of material, copying and quotation restrictions, and copyright issues.

Consider brevity as a norm, but be prepared to reject it when it seems to work against substance.

GENERATING PARTICIPATION— Motivating people to regularly and actively participate can be a problem, particularly because people sign on at their own convenience. Some mechanisms include:

- Extract an agreement about the expected frequency of signing-on. Perhaps at least three to four sessions a week.
- Allow people time at the beginning to get comfortable.
- Have a brainstorming session at the beginning to generate activity and record a variety of issues to be dealt with in slow time later.
- Spell out and frequently repeat that active participation is important.
- Develop the habit of regularly monitoring the membership status of the group.
- Use private messages as reminders and for positive reinforcement.
- Establish explicit expectations around deadlines particularly when input or consensus is required at one phase before the group can progress to the next.
- Make explicit responses to contributions: because there are no non-verbal clues, it is important to be clear as to whether one agrees, disagrees, understands or otherwise.
- Stress that the medium is informal - perfect typing and formal prepared speeches are less important than making one's meaning clear

Use techniques to keep interaction lively and stimulating: pose a question, bring up unexpected factual information, provide simple related games or simulations to promote involvement, take votes or use rating forms to stimulate involvement.

Use anonymity to make an off the wall remark to stimulate discussion.

Fade into the background when appropriate.

Remind participants that earlier items are not set in concrete and are fair game for discussion.

Consider breaking the group into sub-groups.

Don't overload: contribute about one long comment a day to text based conferencing and facilitate rather than dominate the agenda in audio and video conferencing

Keep up with who is contributing what. You may want to ask individuals with special interest in areas to "take charge" of that area.

Don't lecture: too elaborate and too polished a sequence of comments produces silence • use open-ended remarks.

Prompt frequently: use private messages to encourage participants to enter the discussion, to set up debates, and to solicit suggestions.

Don't rely upon off-line materials: the conversation should be based on what is easily available to the participants. Be clear: begin with an opening comment that clearly states the purpose of the interaction and your expectations, and continue to clarify these as the conference progresses.

Provide comments that weave the threads of the discussion every week or two;weaving comments help summarize the state of the interaction and what learning has occurred.

Set up participant interaction which does and does not include you. You may want to facilitate independent sub-group activities which later pool their findings with the larger group.

Take the initiative in establishing conference procedures: Procedural discussions on-line are frustrating and time-consuming, and often distract the group from its real purposes.

Remember that discussion leaders generally contribute one quarter to one half of the on-line material.

- DEAL WITH PROBLEM PEOPLE
  - The "side talker" uses only private messages. Encourage him to participate in the public forum.
  - The "heckler", the "complainer" and the "argumentative pair" can be moved into a side conference with you while you deal with them.
  - Put the "rambler" back on the topic in hand.
  - Explain to the group what the "incoherent person" has been trying to say, after checking with him first.
  - Thank the "eager beaver" for his participation, but suggest that other will have to catch up first. Connder giving him a specific task.
  - The "non-participant" is the most serious problem. Try to find out why they are not participating. Reluctance to express themselves? Discomfort with the medium? Insecurity in expressing thoughts? Have nothing to say? Hardware problems?
  - "Laggards" need help quickly before they fall too far behind.
  - "Dropout*" need to be identified and minimized. Perhaps the first call is from "technical first-aid."
  - The victim of "information overload" needs help. Information overload is the cognitive cost of the medium.

    Encourage use of system features such as filters, associations, keywords, alarms, reminder files, search and retrieval capabilities, and the conference index.

4.3.4 Moderating Audio Teleconferencing[1]

Collaborative team work on a global scale is increasing within Digital as we enter the 1990s, and holding team meetings via teleconference is becoming the norm. Teleconferences build effective teams and enable efficient communication among geographically dispersed work groups. Pre-meeting planning and teleconference techniques will build successful teleconferences. The following guidelines will help the moderator who is engaging in specifically in audio teleconferencing.

4.3.4.1 Pre-conferenclng coordination

- **Distribute meeting agenda. Include time lines to accomplish agenda within allotted time; build in Q&A time.**
- **Distribute participant list including sites.**
- **Distribute relevant text/print materials in advance.**
- **Consider having all participants call into conference from their desks (rather than always using a speakerphone). This will equalize the group communication flow, minimizing potential "weTthey" feelings.**

4.3.4.2 Teleconferencing Techniques

- **Rely on AUDIO cues in the teleconference to replace the interpersonal visual cues:**
  - **Identify yourself when you speak. Example: Hi, this is Alice Wellington at Virginia Road.**
  - **Speak to others by name. Example: Carl, what do you think of the new control system?**
  - **Express yourself in terms people can visualize.**
- **Effective communication strategies for in-person meetings also work in a teleconference. Inclusive meeting behavior is key:**
  - **Begin the teleconference with a roll call of participants (equivalent to meeting introductions). Going site-by-site, ask each participant to identify themselves for the group.**

[1] **Adapted from ALICE H. WELLINGTON,TELECONFERENCING HANDBOOK.ltUcommunication* Systems Group, Digital Equipment Corporation, 1989**

- Use printed material, meeting agenda and user list for reference. These can be transmitted on-line prior to each group session.
- Consider appointing a group member to handle session protocols; the session leader is freed to concentrate on session purpose.

- Acronyms or jargon often depend on context for their meaning. Spell them out and offer explanation to prevent confusion. This is particularly true with international groups.
- Stimulate interaction from all participants in a Q&A period; the leader or facilitator may call on each site round-robin-style.
- Limit side conversations in group-to-group teleconferences. When short side conversations do occur, summarize the comments for all conference participants and invite feedback.
- Listening intently can bring on fatigue, loss of attention among participants. Interaction stimulates interest. So, vary the meeting's pace.
- Limit presentations to 10 minute segments; follow with Q&A.
- Consider limiting the teleconference to 2 hours maximum length for one session.
- Summarize, list action items, provide closure.

4.3.4.3 Provldt text or visual support

- Encourage group interaction by providing text/visual materials to all participants before the session.
- Refer to the materials during session; poll participants for comments.
- Do not refer to visual materials in the room (flip charts, white board, photos, etc.) that all members cannot see. Use fax where possible; exchange fax numbers beforehand.
- For regularly scheduled conference calls requiring shared text or image, consider purchasing dedicated facsimile machines, freeze-frame video or imaging devices.

For further information on teleconferencing systems and applications, contact Alice Wellington at the Teleconferencing Systems Group in Digital Telecommunications at DTK 273-5436 or OVRO.

4.4 Providing feedback is a shared responsibility of participants

As part of a face to face group individuals are constantly reading the nonverbal communication such as gestures, facial express, voice tone,and change in body position. In essence, the communicators are monitoring the interaction looking for feedback that says *"how things are going."* These feedback messages are both verbal and non-verbal. Communicators become accustomed to *reading* the nonverbal messages for level of understanding, agreement, or meaning that is shared among the participants in the interaction. In networked collaborative networked environments, participants develop special strategies for monitoring the interaction and the feedback. When nonverbal feedback is limited as in text-based CNL, special focus is placed on providing explicit feedback. However, participants can improve the quality of their messaging even when they have high fidelity communication such as video conferencing by focusing explicitly on providing feedback to each other.

4.4.1 Eliciting and contributing feedback

4.4.1.1 Feedback on tht process

David and Roger Johnson (1987) [1] suggest focusing feedback on the collaborative process as well as the specific content of the group effort.

- **Focus observation on the interaction of the group and its own processes. If the team is to continue to collaborate and grow as a group, it will need to focus on itself as a group.**
- **Share observations on where the group is collectively and how individuals have contributed to that direction.**
- **Direct group process observations to issues which will help improve their overall productivity and satisfaction.**

[1] **David W. Johmon and Rog.r T. Johnson Learning Together and AloneiCooperaiive, •nd ladfridnaJistk: learaing.Pr*ntic*-Hall, EngUwood Cliffs, N*w J«rs*y,pps.ll2,146, 166-168.**

4.4.1.2 Feedback on the content messages

While any participant may assume responsibility for eliciting feedback and confirming meaning from other participants, all members of the learning group share the responsibility for clarification and confirmation. Each individual participates actively to let others know their current level of understanding or acceptance. Based on their research [2] in group communication, David and Roger Johnson offer the following ground rules for effective feedback among individuals:

- **Give feedback as quickly as possible. Rather than allowing mis* understandings to multiple and continue through a series of exchanges, member check for understanding regularly.**
- **Focus on description and personal interpretations of messages rather than judgment or evaluation.**
- **Focus on the particular message or behavior of the participant rather than imagined personality traits.**
- **Offer personal interpretations such as /** ***perceive... "or I understand... "*** **rather than impersonal such as "** ***The general perception is....."*** **or** ***"The level of understanding is .....*****"**
- **Provide only the amount of information that can be meaningful at the time,rather than a dissertation.**
- **Be specific and focused rather than general and abstract. It is meaningful within the present context of the group communication.**

4.5 Creating a context for learning

For groups to engage in learning together for any period of time, attention needs to be devoted to maintenance of a context that shows acceptance and concern for the individual well being of the members. It is critically important to focus on socioemotional context of the interaction as well as the content.

[x] **Much of the available reaearch on effective feedback in human communication ia baaed on reaearch in human psychology and group interaction. This reaearch ia uaeful in understanding the basic ground rules for facilitation. Currant reaearch into the unique characteristics of electronic mediated enrironmenta are examining issues such aa the effect of delay and the organization and display of feedback meaaagea aa part of a communication system. Additional reaearch into the nature of feedback and interaction in networking learning groups ia needed.**

Often in networked environments, when the "clock is ticking", facilitation on the socioemotional level is ignored in favor of getting on with the task. Unfortunately, the task may be accomplished but the level of satisfaction with the media and group experience are perceived low. Individuals are consequently less willing to engage in similar networked experiences. Rice and Love in their study of "Electronic Emotion"[1] explain that it is perhaps the group norms, goals, and structure of the community of participants that influence the amount of socioemotional exchange. If for example, network use is restricted or oriented to exchanging task-oriented information only, its unlikely that a a cohesive group will develop.

4.5.1 Mutual exchange of trusting and trustworthy messages are essential to building context.

When members feel that they trust each other, they will provide the vital communication necessary for all members to achieve understanding, higher task performance and greater productivity.

- **Foster a supportative environment in which individuals trust each other enough to express their views, to test out ideas and interpretations about how things work or should work, to inquire with others.**
- **Maintain conscious attention to the development and maintenance of trust in a collaborative group.**
  - **Encourage mutual exchange of trusting and trustworthy messages.**

Johnson and Johnson (1986)[1] view the development of trust through a mutual exchange of trusting and trustworthy behaviors. *Trusting* behavior is defined as openly expressing thoughts, feelings, reactions, information,ideas and resources. *Trustworthy* behavior is defined as expressions of acceptance and high regard for the participants, expressions of support for the capabilities of members, and expressions that you are going to work with the other members of the group to achieve the group goals.

[1] **Rio*, Ronald and Gall Lor*. 1987. "Electronic Emotion: Socioemotional Content in a Computer-Mediated Communication Network," Communication IUe«arch,February, Vol 14, No 1. pp. 86-108.**

[1] **David Johnson and Prank Johnaon. 1986. Joining; Together: Group Theory and Group Skills, Prentice-Hall, Englewood Cliffs, New Jersey.**

Groups where participation is ad hoc, of short life span, or when the group is created for limited information ezchange,less time and energy may be available or necessary for building and maintaining the high level of trust which is critical for success and participation of an on-going group.

4.5.2 Personal Risk in Collaboration

Participants share a certain degree of personal risk sending messages and providing feedback to one another.

- **Encourage and challenge members to risk reconstructing ideas and thoughts.**
- **Support the process by avoiding personal attacks. If an individual is constantly attacked, put down or told that they are wrong, that person will be less likely to continue to participate. Computer based notes conference participants generally attempt to discourage *flaming*[1]**

  As a measure of risk taking, members of a team are constantly asking and answering for themselves the question: " If I were to openly express myself, will what I say be used against me." A member of a learning group will not test out hypotheses about new strategies or attempt to check out what has been understood, if another member is waiting for others to make a "mistake" so that s/he can correct.

4.5.2.1 Anonymous messages

One way that text-based computer conferencing has developed for sharing risky ideas, is to provide for anonymous messaging. The message can be posted with the "FROM" portion of the message stripped off. When trust is low in a team,anonymous messaging can provide an opportunity for individuals to address sensitive issues. For instance, an anonymous message might help the group focus on its on 'process' at a time when no individual member felt comfortable owning the observation.

[1] **Flaming i* • term popular among u*er* of computer ba*ed conferencing *y*tem* and bulletin board*. It refer* to pereonal attacks, put down*, and unfair •Yaluation* of other* and their idea*. When thi* occur* in a conferencing member* of the group will general attempt to diecourage the communication.**

4.5.2.2 Private messaging

Another strategy is for groups members to establish themselves as a private group. In an intact group which is private, participants know that any messages shared will only be available to members of the group. If a person knew that only a trusted group of individuals would have access to the communication, then s/he would be more willing to express ideas openly. Restricted, closed groups are useful for increasing level of trust, and open dialog. However, the possibility of learning which might occur from open exchange with a variety of divergent opinions is lost when the group restricts access to the outside world. Both options are available in all forms of non broadcast electronic exchange. The decision is made based upon the purpose and desired outcomes of the group.

4.6 Participation Check List

A* a summary to this section of the handbook, I have included a listing of different types of messages which facilitate learning. Each successful CNL experience focuses on the effective use of these different messages.

4.6.1 Facilitating messages for understanding

The work of Dr. Mildred Shaw [1] is useful in helping to understand the types of messages that facilitate learning. As part of her work in personal construct psychology, Shaw hat identified different behaviors to help individuals to extend and understand their own thinking in networked groups. Participants need to focus on messages which facilitate the learning process in order to:

- **see the relationship of their points of view to those of others;**
- **bridge the gap of using different terminology for the same mental constructs;**
- **bridge the gap of different constructs being talked about using the same terminology;**
- **extend their own construct systems through interaction with others;**
- **share with others constructs that they have found valuable; and finally**
- **investigate areas of disagreement or agreement among members of a group.**

[1] **Shaw, Mildred. 1987. "InteractiYe Elicitation and Exchange of Knowledge in Group Problem Bolting," Paper preeenUd to th* Seventh International Congraaa on Perron Construct Peyeliology„Memphi«,T»nneeee«, Auguat 14-9,1987.**

4.6.2 Providing relevant examples to learners

The availability and accessibility of relevant examples is critical to the on-going learning process. However, the example must be of personal relevance. Relevance would result from one of of three conditions:

- the facilitator understands the learner and the state of processing at the time well enough to provide relevant examples,
- the individual is aware of his current state and is able to request the required knowledge independently, or
- the individual and the facilitator negotiate a strategy for discovery or uncovering the required information.

One key advantage of message sharing in a networked environment is that collaborators theoretically have the possibility to draw on relevant information and knowledge from a wide range of sources, either from other participants directly in a synchronous channel such as through audio or video networks or through asynchronous channels such as CMC or by accessing information stored in a database.

4.6.3 Paraphrasing for confirmation of understanding.

It is important to provide ways for checking the perception and understanding of the messages by all members of the group. Members often assume that they understand the intended meanings when in fact a shared meaning never occurs.

One useful strategy which facilitates the collaboration process is checking understanding through active paraphrase. Johnson and Johnson [2] suggest that the use of paraphrase for perspective-taking can advance understanding and shared meaning in groups. This involves a process of constant checking and rechecking understanding of individuals and the members of the group as interaction progresses. Using messages such as "Are you saying....." or "Let me see if I can summarize, how I see your point of view," the group moves toward shared meaning. Hie strategy of paraphrasing is designed to promote understanding rather than debate. The following guidelines have proven useful for facilitation through paraphrase:

- restate the other person's messages in your own words,

[2] **JohnMm, Dvrid and Frank P. Johnwm, p. 244**

- **do not indicate disapproval or approval .offer advice or blame until the other person has acknowledged the accuracy of your paraphrase,**
- **wait for a confirming message from the other person before proceeding with discussion of the issue,and**
- **continue the paraphrasing process until confirmation is reached.**

4.6.4 Providing feedback to co-learners

Feedback is crucial to the creation of meaning in a social context; it is the basic element of the process which allows learners to validate their knowledge with others.

David and Roger Johnson (1987) [1] offer some general characteristics of feedback.

- **Effective feedback is as immediate as possible;rather than allowing misunderstandings to multiple and continue through a series of exchanges, members check for understanding regularly.**
- **Effective feedback focuses on description and personal interpretations of messages rather than judgment or evaluation.**
- **Effective feedback focuses on the particular message or behavior of the participant rather than imagined personality traits.**
- **Effective feedback is personal such as I *perceive...* or I *understand...* rather than impersonal such as *The general perception is.....* or *The level of understanding is ……***
- **Effective feedback provides only the amount of information that can be understood or is meaningful at the time,rather than a dissertation.**
- **Effective feedback is specific and focused rather than general and abstract. It is meaningful within the present context of the group communication.**

[1] **DtYid W. Johnson and Roger T. Johnson Learning- Together and AlonerCoop«ratire, Competitive, •ad IadiTida*U*tic U«rain«Pr«ntic*-H*]l, Englewood *Cliffs,* New J«rwj,pp«.112,146, 166-158.**

4.6.5 Providing feedback on group process

One often neglected aspect of feedback is the collaborative process itself. The Johnson's suggest that members of a group who are attempting to engage in collaborative learning focus feedback on group process as well as the specific content of the group efforts.